

State of Hawaii
DEPARTMENT OF LAND AND NATURAL RESOURCES
Division of Aquatic Resources
Honolulu, Hawaii 96813

May 8, 2009

Board of Land
and Natural Resources
Honolulu, Hawaii

Request for Authorization and Approval to Issue a Papahānaumokuākea Marine National Monument Research Permit to Ryan Nichols, NOAA Fisheries, Pacific Islands Fisheries Science Center, for Access to State Waters to Conduct Fish Growth Study Research Activities

The Division of Aquatic Resources (DAR) hereby submits a request for your authorization and approval for issuance of a Papahānaumokuākea Marine National Monument research permit to Ryan Nichols, fisheries biologist, Pacific Islands Fisheries Science Center, pursuant to § 187A-6, Hawaii Revised Statutes (HRS), chapter 13-60.5, Hawaii Administrative Rules (HAR), and all other applicable laws and regulations.

The research permit, as described below, would allow entry and activities to occur in the Papahānaumokuākea Marine National Monument (Monument), including the NWHI State Marine Refuge and the waters (0-3 nautical miles) surrounding the following sites:

- Kure Atoll State Seabird Sanctuary

The activities covered under this permit would occur from June 1, 2009 through July 31, 2009.

Portions of the proposed activities have been previously permitted and conducted in the Monument.

INTENDED ACTIVITIES

The applicant proposes to conduct a growth study on hapu'upu'u (Hawaiian grouper). Construction of an accurate growth curve requires empirical validation of the periodicity of marks on growth structures used to assign ages to fish individuals. Growth marks are readily apparent on cross-sectioned otoliths (ear stones – typically used to age marine fish) of hapu'upu'u. The only technique available for validating the exact age estimate of an individual fish is injecting individuals with a fluorescent biomarker such as oxytetracycline (OTC) and then harvesting the fish after a period of time spanning formation of the growth mark. Harvested fish are then sacrificed and their otoliths extracted, sectioned, and examined for the presence of annuli peripheral to the fluorescent mark. The purpose of the applicant's research is to provide the validation of age estimates necessary for accurately describing the age and growth of hapu'upu'u.

The proposed activities would occur in collaboration with, and would be carried out by, Carl Meyer, HIMB. Carl Meyer has proposed, in a separate permit application, to capture and tag individual hapu'upu'u as part of his predator movement studies. The applicant proposes that an additional 15 specimens (10 at Kure and 5 at Midway) be captured and injected. These fish would be collected in either 2010 or 2011, as a continuation of the study, under a separate permit.

The methods used to capture and tag hapu'upu'u are described in Carl Meyer's application and state that SCUBA divers would capture hapu'upu'u by handlining (using a single baited hook) underwater. Captured hapu'upu'u would be restrained on the sea bed in a hand net during the procedure. Every fish captured and injected would also receive an external dart tag.

The use of OTC to validate growth mark formation in commercially harvested and other fishes has a long history of success. At the proposed concentrations (which are accepted standard for marking fish otoliths), OTC is non-toxic to fishes. Although the application of OTC is presently regulated for domestic animal populations only under the Code of Federal Regulations (C.F.R.) 21, 556.500, the spirit of the law is to proactively prohibit the unknowing consumption of antibiotics by humans. The applicant points out that based on 2008 observations (C. Meyer, unpubl. data), the grouper to be OTC-marked appear to be resident to the study sites and occur well inshore of the boundary that forms the spatial fishery closure protecting resources on the shallow forereef of Kure atoll. Furthermore, no Ho'omalu Zone-permitted bottomfishers fish as far upchain as Kure atoll and therefore the chance that OTC-marked fish would be captured by fishers is essentially zero. All recreational or commercial extraction of reef fishes at Midway Atoll is currently prohibited. Lastly, all OTC-marked fishes would be individually recognizable with external tags; notices advertising such would be distributed to licensed Ho'omalu Zone fishers well in advance of the marking study.

The proposed project would lead to better understanding of the biology of both NWHI and MHI populations of hapu'upu'u, and is necessary to help conserve populations being protected within the Monument, as well as populations subject to regulated extraction in the MHI.

The activities proposed by the applicant directly support the Monument Management Plan's priority management needs 3.1 – Understanding and Interpreting the NWHI (through action plan 3.1.1 – Marine Conservation Science).

The activities described above may require the following regulated activities to occur in State waters:

- ☒ Removing, moving, taking, harvesting, possessing, injuring, disturbing, or damaging any living or nonliving monument resource
- ☒ Discharging or depositing any material or matter into the Monument
- ☒ Possessing fishing gear except when stowed and not available for immediate use during passage without interruption through the Monument
- ☒ Attracting any living Monument resource

- ☒ Swimming, snorkeling, or closed or open circuit SCUBA diving within any Special Preservation Area or Midway Atoll Special Management Area

REVIEW PROCESS:

The permit application was sent out for review and comment to the following scientific and cultural entities: Hawaii Division of Aquatic Resources, Hawaii Division of Forestry and Wildlife, Papahānaumokuākea Marine National Monument (NOAA/NOS), NOAA Pacific Islands Regional Office (NOAA-PIRO), United States Fish and Wildlife Service Hawaiian and Pacific Islands National Wildlife Refuge Complex Office, and the Office of Hawaiian Affairs (OHA). In addition, the permit application has been posted on the Monument Web site since March 11th, giving the public an opportunity to comment. The application was posted within 40 days of its receipt, in accordance with the Monument's Public Notification Policy.

Comments received from the scientific community are summarized as follows:

Scientific reviews support the acceptance of this application.

Concerns raised were:

1. If the applicant will be physically accompanying and assisting Carl Meyer with the proposed activities in the NWHI
2. What safeguards would be in place to guarantee that these fish (or anything that may consume these fish) won't be consumed by humans, given that NOAA Ships/other vessels permitted to sustenance fish have caught Hapu'upu'u and consumed them in the NWHI in the past
3. Explanation needed for why applicant can not use the findings of previous studies that have used OTC with epinepheline groupers to demonstrate that single annulus are formed each year in this genus
4. If funding has already been secured for recollection activities in 2010 and/or 2011

Comments received from the Native Hawaiian community are summarized as follows:

Cultural reviews support the acceptance of this application. No concerns were raised.

Comments received from the public are summarized as follows:

No comments were received from the public on this application.

Additional reviews and permit history:

Are there other relevant/necessary permits or environmental reviews that have or will be issued with regard to this project? (e.g. MMPA, ESA, EA) Yes ☒ No ☐

If so, please list or explain:

- The proposed activities are in compliance with the National Environmental Policy Act.

Has Applicant been granted a permit from the State in the past? Yes ☐ No ☒

If so, please summarize past permits:

Have there been any a) violations: Yes ☐ No ☒
b) Late/incomplete post-activity reports: Yes ☐ No ☒

Are there any other relevant concerns from previous permits? Yes ☐ No ☒

RESPONSE:

1. The applicant points out that he would not be present in the NWHI. Carl Meyer is the designated Field PI and would oversee the proposed work.
2. The applicant explains that the safeguards established to guarantee that OTC tagged fish would not be consumed are as follows; external dart tag that indicates if a specific fish is tagged with OTC, communication with Commanding Officers of any NOAA vessel operating in NWHI, notification to permitted NWHI fishermen and DLNR informing of OTC research, site locations and use of external tags via flyer and personal communication.
3. The applicant explains the primary reason to conduct OTC on Hapu'upu'u is that the presence of annuli is an environmental phenomenon, not a taxonomic. Currently, there are no published validations for annuli among epinepheline of the NWHI, MHI or most of the Central Pacific. Due to the potential effects the environment has on annuli formation the extrapolation of the findings from other studies to Hapu'upu'u annuli would be invalid. Although it may be assumed that congeners might share traits of annuli formation the validation of the timing and periodicity must be preformed if any age and growth estimates are to be calculated for this species.
4. The applicant states that funding for the recollection activites is being persued but is not yet secured.

STAFF OPINION:

DAR staff is of the opinion that Applicant has properly demonstrated valid justifications for his application and should be allowed to enter the NWHI State waters and to conduct the activities therein as specified in the application with the following special instructions and conditions,

which are in addition to the Papahānaumokuākea Marine National Monument Research Permit General Conditions. The following special conditions have been vetted through the legal counsel of the Co-Trustee agencies.

1. To prevent introduction of disease or the unintended transport of live organisms, the permittee must comply with the disease and transport protocol attached to this permit.
2. Tenders and small vessels must be equipped with engines that meet EPA emissions requirements.
3. Refueling of tenders and all small vessels must be done at the support ships and outside the confines of lagoons or near-shore waters in the State Marine Refuge
4. No fishing is allowed in State Waters except as authorized under State law for subsistence, traditional and customary practices by Native Hawaiians.

MONUMENT MANAGEMENT BOARD OPINION:

The MMB is of the opinion that the Applicant has met the findings of Presidential Proclamation 8031 and this activity may be conducted subject to completion of all compliance requirements. The MMB concurs with the special conditions recommended by DAR staff.

RECOMMENDATION:


"That the Board authorize and approve, with stated conditions, a Research Permit to Ryan Nichols, Pacific Islands Fisheries Science Center."

Respectfully submitted,



DAN POLHEMUS
Administrator

APPROVED FOR SUBMITTAL



LAURA H. THIELEN
Chairperson

Papahānaumokuākea Marine National Monument
RESEARCH Permit Application

NOTE: This Permit Application (and associated Instructions) are to propose activities to be conducted in the Papahānaumokuākea Marine National Monument. The Co-Trustees are required to determine that issuing the requested permit is compatible with the findings of Presidential Proclamation 8031. Within this Application, provide all information that you believe will assist the Co-Trustees in determining how your proposed activities are compatible with the conservation and management of the natural, historic, and cultural resources of the Papahānaumokuākea Marine National Monument (Monument).

ADDITIONAL IMPORTANT INFORMATION:

- Any or all of the information within this application may be posted to the Monument website informing the public on projects proposed to occur in the Monument.
- In addition to the permit application, the Applicant must either download the Monument Compliance Information Sheet from the Monument website OR request a hard copy from the Monument Permit Coordinator (contact information below). The Monument Compliance Information Sheet must be submitted to the Monument Permit Coordinator after initial application consultation.
- Issuance of a Monument permit is dependent upon the completion and review of the application and Compliance Information Sheet.

INCOMPLETE APPLICATIONS WILL NOT BE CONSIDERED

Send Permit Applications to:

Papahānaumokuākea Marine National Monument Permit Coordinator

6600 Kalaniana'ole Hwy. # 300

Honolulu, HI 96825

nwhiperm@noaa.gov

PHONE: (808) 397-2660 FAX: (808) 397-2662

SUBMITTAL VIA ELECTRONIC MAIL IS PREFERRED BUT NOT REQUIRED. FOR ADDITIONAL SUBMITTAL INSTRUCTIONS, SEE THE LAST PAGE.

Papahānaumokuākea Marine National Monument Permit Application Cover Sheet

This Permit Application Cover Sheet is intended to provide summary information and status to the public on permit applications for activities proposed to be conducted in the Papahānaumokuākea Marine National Monument. While a permit application has been received, it has not been fully reviewed nor approved by the Monument Management Board to date. The Monument permit process also ensures that all environmental reviews are conducted prior to the issuance of a Monument permit.

Summary Information

Applicant Name: Ryan S. Nichols

Affiliation: NOAA Fisheries, Pacific Islands Fisheries Science Center

Permit Category: Research

Proposed Activity Dates: June 10-July 2, 2009

Proposed Method of Entry (Vessel/Plane): NOAA ship Hi'ialakai

Proposed Locations: Kure and Midway atolls

Estimated number of individuals (including Applicant) to be covered under this permit:

4

Estimated number of days in the Monument: 22

Description of proposed activities: (complete these sentences):

a.) The proposed activity would...
substantively increase the information necessary to effectively manage and conserve stocks of the endemic hapu'upu'u or Hawaiian grouper at minimal risk and impact to its populations (ecological resource of the P-MNM) or to P-MNM cultural/historical resources.

b.) To accomplish this activity we would
Conduct a collaborative study utilizing services and specimens provided by another P-MNM-permitted research study. In a separate Permit Application, Carl Meyer (HIMB) is proposing that, during summer 2009, a three-member dive team will capture and tag individual hapu'upu'u on the forereefs of Kure and Midway atolls using the same methods that their group successfully developed on cruises to Kure and Midway in May and August 2008. Fish will be hand-lined/netted in situ, measured (total length, TL in cm), internal acoustic tags implanted, and the fish marked with an external tag enabling recognition of prior-tagged individuals by divers underwater.

We herein propose that each of an additional maximum of ten (10) and five (5) subadult-adult grouper of a range of sizes (> 50 cm TL), at Kure and Midway atolls, respectively, be injected intraperitoneally using sterilized syringes loaded with 50 mg of the antibiotic oxytetracycline

(OTC, Liquimycin® 200) per kg body weight. For fish ranging in size from about 50-100 cm TL, the respective body weights and OTC dosages would be 2.5-20 kg (Nichols and DeMartini 2009) and about 125-1,000 mg/75-500 mg (0.6-5.0 ml/0.3-2.5 ml).

c.) This activity would help the Monument by ...
providing the validation of age estimates necessary for accurately describing the age and growth of hapu'upu'u. The management of the extracted (MHI) and the conservation of protected (NWHI) stocks of this species are dependent on our knowledge of sustainable levels of take in the MHI, and the latter require sound age-growth and related life history data.

Other information or background: This collaborative study between academia (HIMB) and federal fisheries biologists would contribute substantively to the growing need and mandate for sharing natural resource specimens and the costs involved in their research.

Section A - Applicant Information

1. Applicant

Name (last, first, middle initial): Nichols, Ryan S.

Title: Fisheries Biologist (Research)

1a. Intended field Principal Investigator (See instructions for more information):

Carl Meyer, Hawaii Insitute of Marine Biology, U Hawaii

2. Mailing address (street/P.O. box, city, state, country, zip):

[REDACTED]

Phone: [REDACTED]

Cell: [REDACTED]

Fax: [REDACTED]

Email: [REDACTED]

For students, major professor's name, telephone and email address:

3. Affiliation (institution/agency/organization directly related to the proposed project):

The proposed work is a collaborative study by NOAA Fisheries, Pacific Islands Fisheries Science Center, and the Hawaii Insitute of Marine Biology, Univ. Hawaii.

4. Additional persons to be covered by permit. List all personnel roles and names (if known at time of application) here (e.g. John Doe, Research Diver; Jane Doe, Field Technician):

HIMB personnel: two (2) diver-technicians (tbd)

Section B: Project Information

5a. Project location(s):

<input type="checkbox"/> Nihoa Island	<input type="checkbox"/> Land-based	<input type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input type="checkbox"/> Necker Island (Mokumanamana)	<input type="checkbox"/> Land-based	<input type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input type="checkbox"/> French Frigate Shoals	<input type="checkbox"/> Land-based	<input type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input type="checkbox"/> Gardner Pinnacles	<input type="checkbox"/> Land-based	<input type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input type="checkbox"/> Maro Reef			
<input type="checkbox"/> Laysan Island	<input type="checkbox"/> Land-based	<input type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input type="checkbox"/> Lisianski Island, Neva Shoal	<input type="checkbox"/> Land-based	<input type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input type="checkbox"/> Pearl and Hermes Atoll	<input type="checkbox"/> Land-based	<input type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input checked="" type="checkbox"/> Midway Atoll	<input type="checkbox"/> Land-based	<input checked="" type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input checked="" type="checkbox"/> Kure Atoll	<input type="checkbox"/> Land-based	<input checked="" type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input type="checkbox"/> Other			

NOTE: There is a fee schedule for people visiting Midway Atoll National Wildlife Refuge via vessel and aircraft.

Location Description:

Shallow (< 30-m deep) forereef at Kure and Midway atolls

5b. Check all applicable regulated activities proposed to be conducted in the Monument:

- ☒ Removing, moving, taking, harvesting, possessing, injuring, disturbing, or damaging any living or nonliving Monument resource
- ☐ Drilling into, dredging, or otherwise altering the submerged lands other than by anchoring a vessel; or constructing, placing, or abandoning any structure, material, or other matter on the submerged lands
- ☒ Anchoring a vessel
- ☐ Deserting a vessel aground, at anchor, or adrift
- ☐ Discharging or depositing any material or matter into the Monument
- ☐ Touching coral, living or dead
- ☒ Possessing fishing gear except when stowed and not available for immediate use during passage without interruption through the Monument
- ☐ Attracting any living Monument resource
- ☐ Sustenance fishing (Federal waters only, outside of Special Preservation Areas, Ecological Reserves and Special Management Areas)
- ☐ Subsistence fishing (State waters only)
- ☒ Swimming, snorkeling, or closed or open circuit SCUBA diving within any Special Preservation Area or Midway Atoll Special Management Area

6 Purpose/Need/Scope *State purpose of proposed activities:*

In a separate Permit Application for June+ 2009 research, Carl Meyer (HIMB) is providing the rationale and justification for conducting in situ capture, external tagging, acoustic transmitter implantation, and release of hapu'upu'u grouper at Kure and Midway atolls on the same June-July 2009 cruise. Our justification for our Permit Application is as follows.

In addition to information on movement patterns, complementary data on age, growth, and other specific life-history attributes such as size-at-maturity and spawning seasonality of hapu'upu'u grouper are presently lacking. Combined parameter estimates provide the comprehensive input necessary for a detailed stock assessment of this commercially valuable (MHI and NWHI), Hawaiian endemic species. Understanding the biology of both NWHI and MHI populations will be necessary to help conserve populations being protected within the P-MNM and populations subject to regulated extraction in the MHI.

Construction of an accurate growth curve requires empirical validation of the periodicity of marks on growth structures used to assign ages to fish individuals. Growth marks are readily apparent on cross-sectioned otoliths (ear stones – a type of hard part typically used to age marine fish) of hapu'upu'u. Marks on hapu'upu'u otoliths appear to be formed annually, but the accuracy of the age estimates still requires validation (Nichols and DeMartini 2009). The only technique available for validating the exact age estimate of an individual fish is injecting each of a series of individuals with a fluorescent biomarker such as oxytetracycline (OTC) and then harvesting the fish after a period of time spanning formation of the growth mark. (Annuli on hapu'upu'u otoliths appear to complete translucent zone formation in late spring.) Harvested fish are then sacrificed and their otoliths extracted, sectioned, and examined microscopically under ultraviolet light in a darkened room to evaluate whether how many annuli are present peripheral to the fluorescent mark. For example, the presence of a single annulus peripheral to the fluorescent mark on the otolith of a fish at liberty for a year validates a once-yearly formation of the presumed annual growth mark.

The use of OTC to validate growth mark formation in commercially harvested and other fishes has a long history of success. At the proposed concentrations (which are accepted standard for marking fish otoliths), OTC is non-toxic to fishes. Although the application of OTC is presently regulated for domestic animal populations only under the Code of Federal Regulations (C.F.R.) 21, 556.500, the spirit of the law is to proactively prohibit the unknowing consumption of antibiotics by humans. Based on 2008 observations (C. Meyer, unpubl. data), however, the grouper to be OTC-marked appear to be resident to the study sites and occur well inshore of the boundary that forms the spatial fishery closure protecting resources on the shallow forereef of Kure atoll. Furthermore, no Ho'omalu Zone-permitted bottomfishers fish as far upchain as Kure atoll and therefore the chance that OTC-marked fish will be captured by fishers is essentially nil. All recreational or commercial extraction of reef fishes at Midway Atoll is currently prohibited. Lastly, all OTC-marked fishes will be individually recognizable with external tags; notices advertising such would be distributed to licensed Ho'omalu Zone fishers well in advance of the marking study.

References

Nichols RS, DeMartini EE (2009) Preliminary estimates of age and growth for the endemic Hawai'ian grouper (hapu'upu'u, *Epinephelus quernus*, F. Serranidae). Pacific Islands Fisheries Science Center, PIFSC Administrative Report H-09-x.

7. Answer the Findings below by providing information that you believe will assist the Co-Trustees in determining how your proposed activities are compatible with the conservation and management of the natural, historic, and cultural resources of the Monument:

The Findings are as follows:

a. How can the activity be conducted with adequate safeguards for the cultural, natural and historic resources and ecological integrity of the Monument?

First, by avoiding coral damage by anchoring small craft only on sand adjacent to shallow forereef. Second, by capturing and tagging fish in situ at depth-of-capture to avoid barotrauma that would otherwise result from bringing fish up to the surface to tag. The collaborator (C. Meyer) who is petitioning for a separate permit to continue his group's underwater capture, external tagging, and acoustic transmitter implantation activities in 2009, has demonstrated in his report on 2008 activities that adverse effects are minimal when hapu'upu'u are treated in the described manner. Lastly, we will either review the NOAA vessel Hi'ialakai's cultural briefing material or attend a cultural briefing to ensure proper cultural safeguards are incorporated into research design.

b. How will the activity be conducted in a manner compatible with the management direction of this proclamation, considering the extent to which the conduct of the activity may diminish or enhance Monument cultural, natural and historic resources, qualities, and ecological integrity, any indirect, secondary, or cumulative effects of the activity, and the duration of such effects?

The possibility that some of the tagged hapu'upu'u might be seriously injured or die as a result of capture and tagging has been effectively minimized by successful protocols developed on May and June 2008 research cruises to Kure and Midway.

c. Is there a practicable alternative to conducting the activity within the Monument? If not, explain why your activities must be conducted in the Monument.

There is no practicable alternative to conducting the activity elsewhere, say, in the MHI. Hapu'upu'u grouper are endemic to the Hawaiian Archipelago and Johnston atoll, and they do not occur at diving depths in the MHI or Johnston. And, in order to conduct the study, the tagging and marking of individual fish must be done underwater by divers at 10-30 m depths.

d. How does the end value of the activity outweigh its adverse impacts on Monument cultural, natural and historic resources, qualities, and ecological integrity?

The potential benefit, specifically to the Monument, which has an interest in biodiversity and habitat as they relate to native species, is the direct need to better document life history, habitat requirements, and the role that the native species like hapu'upu'u play in maintaining a stable ecosystem. In addition to the Monuments understanding of biodiversity and habitat is the compliment of validating the estimated ages of this species, thereby providing accurate input to the assessment of its stock in the MHI. These end values for both the Monument and MHI far outweighs the negatives of any serious injury or mortality of relatively few individuals in the short term (duration of this permit). The benefits of this information for assessing the MHI stock and understanding the biology of this important benthic predator in the P-MNM further overshadow the anticipated future recapture and sacrifice of at most 10 individual fish in 2010-2011.

e. Explain how the duration of the activity is no longer than necessary to achieve its stated purpose.

The cruise duration is no longer than needed to accomplish the proposed activities.

f. Provide information demonstrating that you are qualified to conduct and complete the activity and mitigate any potential impacts resulting from its conduct.

The PIFSC PI (Nichols) has been a working member of a team of respected fisheries research biologists at the PIFSC who work on fish age and growth. Representative, relevant publications include:

DeMartini EE, Landgraf KC, Ralston S (1994) A recharacterization of the age-length and growth relationships of Hawaiian snapper, *Pristipomoides filamentosus*.

NOAA Tech Memorandum NMFS-SWFSC-199 Humphreys RL Jr (2000) Otolith-based assessment of recruitment variation in a North Pacific seamount population of armorhead *Pseudopentaceros wheeleri*. Mar Ecol Prog Ser 204: 213-223

Humphreys RL Jr, Campana SE, DeMartini EE (2005) Otolith elemental fingerprints of juvenile Pacific swordfish *Xiphias gladius*. J Fish Biol 66:1660-1670.

None of the potential impacts on hapu'upu'u populations would require mitigation.

g. Provide information demonstrating that you have adequate financial resources available to conduct and complete the activity and mitigate any potential impacts resulting from its conduct.

The relatively minimal costs (< \$ 0.5 K) required for the fluorescent biomarker and syringes are easily subsumed by the 2009 Life History Program base budget (\$ 30K) within the Fisheries Stock Assessment and Fish Biology Division of the PIFSC.

h. Explain how your methods and procedures are appropriate to achieve the proposed activity's goals in relation to their impacts to Monument cultural, natural and historic resources, qualities, and ecological integrity.

The number of test fish individuals is trivial relative to the resident natural populations at the two atolls. The eventual sacrifice (in 2010-2011) of at most 10 individual fish would have no impact on their populations (estimated from 2002-2008 survey data of the PIFSC, CRED, as about 5 fish per ha at these depths in atoll forereef habitat).

i. Has your vessel has been outfitted with a mobile transceiver unit approved by OLE and complies with the requirements of Presidential Proclamation 8031?
NOAA vessel Hi'ialakai has all the required electronics.

j. Demonstrate that there are no other factors that would make the issuance of a permit for the activity inappropriate.
No

8. Procedures/Methods:

All activities related to the underwater capture, tagging, and release of specimens is described in a separate permit application being submitted by Carl Meyer of HIMB, which describes methods for the monitoring of fish movements.

NOTE: If land or marine archeological activities are involved, contact the Monument Permit Coordinator at the address on the general application form before proceeding, as a customized application will be needed. For more information, contact the Monument office on the first page of this application.

9a. Collection of specimens - collecting activities (would apply to any activity): organisms or objects (List of species, if applicable, attach additional sheets if necessary):

Common name:
hapu'upu'u grouper

Scientific name:
Epinephelus quernus

& size of specimens:
15 total (50-110 cm fork length)

Collection location:
Kure (10 specimens); Midway (5 specimens)

☒ Whole Organism ☐ Partial Organism

9b. What will be done with the specimens after the project has ended?

All fish collected during the period of the permit will have been released underwater at their exact underwater capture sites

9c. Will the organisms be kept alive after collection? ☐ Yes ☐ No

No organisms kept.

- General site/location for collections:

Forereef at 10-30 m depths of Kure and Midway atolls.

- Is it an open or closed system? ☒ Open ☐ Closed

- Is there an outfall? ☐ Yes ☒ No

- Will these organisms be housed with other organisms? If so, what are the other organisms?
No

- Will organisms be released?
Yes

10. If applicable, how will the collected samples or specimens be transported out of the Monument?

None of the fish individuals that are to be collected will be transported anywhere.

11. Describe collaborative activities to share samples, reduce duplicative sampling, or duplicative research:

This collaborative (HIMB, PIFSC) study is unique

12a. List all specialized gear and materials to be used in this activity:

A fluorescent bio-marker (oxytetracycline, aka OTC); sterile syringes to administer solution in situ at depth.

12b. List all Hazardous Materials you propose to take to and use within the Monument:
fluorescent bio-markers (oxytetracycline hydrochloride [OTC]). MSDS are appended.

13. Describe any fixed installations and instrumentation proposed to be set in the Monument:

None

14. Provide a time line for sample analysis, data analysis, write-up and publication of information:

A subset (an estimated 10 individuals) of the fish that have been externally tagged and internally marked with the fluorescent biomarker in 2009 will need to be collected and sacrificed for

extraction of bio-marked otoliths (earstones) in either 2010 (1-yr validation) or 2011 (2-yr validation). Laboratory otolith analysis, statistical data analyses, and incorporation of test results into a manuscript on hapu'upu'u age and growth will extend through 2012. At that time a final draft ms should be available. It is reasonable to expect that results of the study would be published in a peer-reviewed journal like Fishery Bulletin in 2013.

15. List all Applicants' publications directly related to the proposed project:

None _directly_ related to the subject species but one co-author (DeMartini) has published on both the age-growth and reproductive life histories of allied Hawaiian bottomfishes:

DeMartini EE, Lau BB (1998) Morphometric criteria for estimating sexual maturity in two snappers, *Etelis carbunculus* and *Pristipomoides sieboldii*. Fishery Bulletin 97:449-458.

Lau BB, DeMartini EE (1994) An evaluation of oocyte size in multiple regressions predicting gonad weight from body weight: a test using Hawaiian ehu, *Etelis carbunculus*. NOAA Technical memorandum NMFS-SWFSC-212.

DeMartini, Landgraf, Ralston (1994) See full reference in section 7f above.

With knowledge of the penalties for false or incomplete statements, as provided by 18 U.S.C. 1001, and for perjury, as provided by 18 U.S.C. 1621, I hereby certify to the best of my abilities under penalty of perjury of that the information I have provided on this application form is true and correct. I agree that the Co-Trustees may post this application in its entirety on the Internet. I understand that the Co-Trustees will consider deleting all information that I have identified as "confidential" prior to posting the application.

Signature

Date

**SEND ONE SIGNED APPLICATION VIA MAIL TO THE MONUMENT OFFICE
BELOW:**

Papahānaumokuākea Marine National Monument Permit Coordinator
6600 Kalaniana'ole Hwy. # 300
Honolulu, HI 96825
FAX: (808) 397-2662

DID YOU INCLUDE THESE?

- ☒ Applicant CV/Resume/Biography
- ☒ Intended field Principal Investigator CV/Resume/Biography
- ☒ Electronic and Hard Copy of Application with Signature
- ☒ Statement of information you wish to be kept confidential
- ☒ Material Safety Data Sheets for Hazardous Materials

Papahānaumokuākea Marine National Monument Compliance Information Sheet

1. Updated list of personnel to be covered by permit. List all personnel names and their roles here (e.g. John Doe, Diver; Jane Doe, Field Technician, Jerry Doe, Medical Assistant): Dr. Carl Meyer, Principal Field investigator, Hawaii Insitute of Marine Biology, U Hawaii

HIMB personnel: two (2) diver-technicians (tbd)

2. Specific Site Location(s): (Attach copies of specific collection locations): Kure and Midway atolls

3. Other permits (list and attach documentation of all other related Federal or State permits):

3a. For each of the permits listed, identify any permit violations or any permit that was suspended, amended, modified or revoked for cause. Explain the circumstances surrounding the violation or permit suspension, amendment, modification or revocation.

4. Funding sources (Attach copies of your budget, specific to proposed activities under this permit and include funding sources. See instructions for more information): All funding comes from an annual budget of the United States Federal Government for the National Oceanic and Atmospheric Administration.

5. Time frame:

Activity start: June 10, 2009

Activity completion: July 2, 2009

Dates actively inside the Monument:

From: June 11, 2009

To: July 1, 2009

Describe any limiting factors in declaring specific dates of the proposed activity at the time of application: The ship's schedule is subject to change to a variety of factors such as weather delays and changes in project schedules. The actual project dates within the permit time frame are tentative.

Personnel schedule in the Monument: NOAA ship Hi'ialakai Crew and Scientist list will be provided prior to sailing

6. Indicate (with attached documentation) what insurance policies, bonding coverage, and/or financial resources are in place to pay for or reimburse the Monument trustees for the necessary search and rescue, evacuation, and/or removal of any or all persons covered by the permit from the Monument: The federal government is self-insured.

7. Check the appropriate box to indicate how personnel will enter the Monument:

- ☒ Vessel
☐ Aircraft

Provide Vessel and Aircraft information: NOAA Ship HI'IALAKAI IMO # 8835619

8. The certifications/inspections (below) must be completed prior to departure for vessels (and associated tenders) entering the Monument. Fill in scheduled date (attach documentation): These inspections are conducted periodically in accordance with Monument regulations. The inspections will be conducted again between May 26th – June 8th while the ship prepares for the first PMNM cruise of the year.

- ☒ Rodent free, Date: 3-9-09
☒ Tender vessel, Date: 3-12-09
☒ Ballast water, Date: 2-15-09
☐ Gear/equipment, Date: TBD but will be prior to entry into Monument
☐ Hull inspection, Date: TBD but will be prior to entry into Monument

9. Vessel information (NOTE: if you are traveling aboard a National Oceanic and Atmospheric Administration vessel, skip this question):

Vessel name:

Vessel owner:

Captain's name:

IMO#:8835619

Vessel ID#:

Flag:

Vessel type:

Call sign:

Embarkation port:

Last port vessel will have been at prior to this embarkation:

Length:

Gross tonnage:

Total ballast water capacity volume (m3):

Total number of ballast water tanks on ship:

Total fuel capacity:

Total number of fuel tanks on ship:

Marine Sanitation Device:

Type:

Explain in detail how you will comply with the regulations regarding discharge in the Monument. Describe in detail. If applicable, attach schematics of the vessel's discharge and treatment systems: H'IALAKAI, like any other vessel or house hold, inevitably creates waste. The ship carries up to 48 scientists and crew for 30-day periods. The waste generated is relatively small compared to a cruise ship or other larger vessels, but the issue is taken very seriously. The ship has waste management systems and plans, follows or exceeds MARPOL and USCG regulations in all waters, and has a goal to exceed Monument regulations when operating inside the Monument.

Inside the Special Preservation Areas (SPAs) the ship holds everything that flows down a drain. Outside the SPA, the ship legally discharges food scraps, which are not sanitary to store on board, treated sewage (type II MSD effluent), and diluted water from sink and shower drains (grey water) in accordance with regulations and the ship's permit. Water saving equipment was installed in 2007 to reduce the amount of drain water generated each day, substantially reducing the amount of waste water requiring treatment each day.

Discharges such as engine cooling water, deck runoff, and engine exhaust are inevitable to vessel use and are allowed in all areas under the Monument regulations.

The crew of HI'IALAKAI is understanding and respectful of the natural and cultural importance of the Monument, and will strive to minimize all discharges of any type within the Monument.

Other fuel/hazardous materials to be carried on board and amounts: Fuel /

Lubricants: Gasoline, #2 Diesel Fuel, Lubrication Oil & Hydraulic Oil (Amounts will vary per cruise)

Hazardous Materials (MSDS Inventory):

Antifoulant Device	EP-921 (cleaning solvent)
Aqua-Sol 20/20 Marine	Estesol Gold (skin cleanser)
AS-175 Anti-Slip Coating	Eyesaline Concentrate (eyewash)
Various Types of Batteries	First Step
CCX-77	Gasket Remover Aerosol
Cleaner / Degreaser 5G	Gleem Metal Polish
Clorox Bleach	Paints (Various)
LPS CFC - Contact Cleaner	Qurox
Silicone Aerosol	Simple Green (Cleaner / Degreaser)
WD-40	Wedac
ZEP Rust Remover	

Provide proof of a National Oceanic and Atmospheric Administration (NOAA) Office of Law Enforcement-approved Vessel Monitoring System (VMS). Provide the name and contact information of the contractor responsible for installing the VMS system. Also describe VMS unit name and type:

Sailor TT 3606 XP - Thrane & Thrane

VMS Email: 430338120@c.xantic.net

Inmarsat ID#:430388120

* Individuals MUST ENSURE that a type-approved VMS unit is installed and that its automatic position reports are being properly received by the NOAA OLE system prior to the issuance of a permit. To make sure your VMS is properly configured for the NOAA OLE system, please contact NOAA OLE at (808) 203-2503 or (808) 203-2500.

* PERMITS WILL NOT BE ISSUED TO INDIVIDUALS ENTERING THE MONUMENT VIA VESSEL UNTIL NOAA OLE HAS CONTACTED THE MONUMENT PERMIT COORDINATOR WITH A 'POSITIVE CHECK' READING.

10. Tender information:

On what workboats (tenders) will personnel, gear and materials be transported within the Monument? List the number of tenders/skiffs aboard and specific types of motors: The NOAA Ship HI'IALAKAI has the following tenders which will be deployed.

1. 8m - Jetboat Launch - 270 hp Yanmar (Diesel)
2. 10m - Jetboat Launch - 315 hp Yanmar (Diesel)
3. Rescue Boat - Four Stroke 115 hp (Gas)
4. (2) Zodiac inflatable boat - single outboard engine (Four Stroke 50hp)

Additionally, HI'IALAKAI may carry one or more of the following science party provided tenders:

1. 19' Safeboat - twin outboard engines (Four Stroke 60 hp each)
2. 19' Safeboat - twin outboard engines (Four Stroke 75 hp each)
3. 19' Safeboat - AHI multibeam sonar survey launch - Volvo inboard/outboard Diesel (236 hp)

4. (2) Avon inflatable boat - single outboard engine (Four Stroke 50hp)
5. 10m console boat - twin outboard engines (Four Stroke 90 hp each)

Additional Information for Land Based Operations

11. Proposed movement of personnel, gear, materials, and, if applicable, samples:
Not Applicable

12. Room and board requirements on island: Not Applicable

13. Work space needs: none

DID YOU INCLUDE THESE?

- ☐ Map(s) or GPS point(s) of Project Location(s), if applicable
- ☐ Funding Proposal(s)
- ☐ Funding and Award Documentation, if already received
- ☐ Documentation of Insurance, if already received
- ☐ Documentation of Inspections
- ☐ Documentation of all required Federal and State Permits or applications for permits